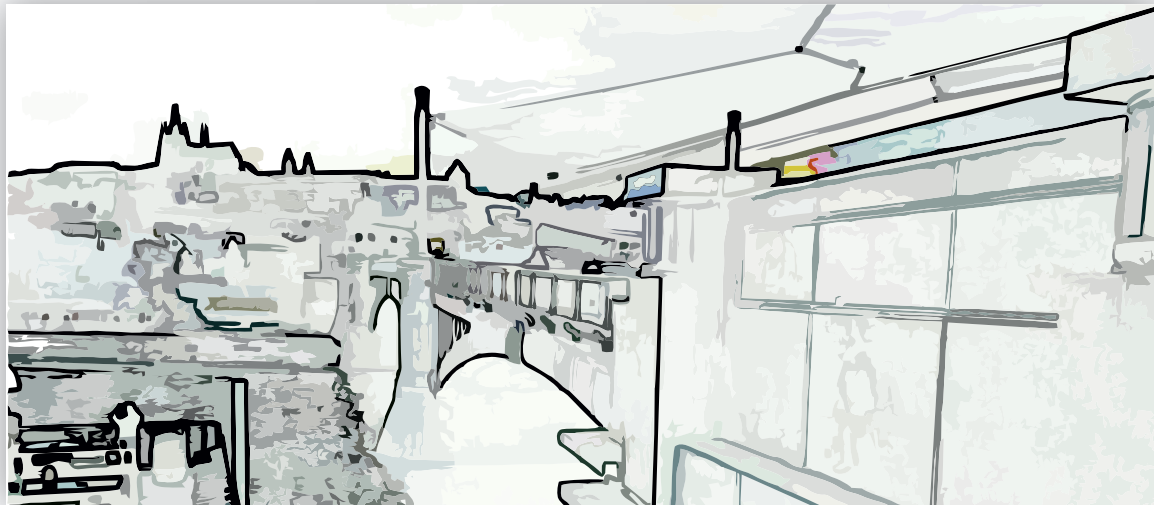


# 12<sup>th</sup> Prague Colloquium on f-Electron Systems + TOKIMEKI 2018



*Prague, 4<sup>th</sup> - 7<sup>th</sup> July 2018*

## Program & Abstracts



## Welcome to PCFES!

Almost every second year since 1992 we organized the *Prague Colloquium on  $f$ -Electron Systems*, an exciting meeting covering topics in physics of actinides and lanthanides. Also this year we keep the tradition having the pleasure to welcome you at 12<sup>th</sup> PCFES, an informal forum for presentations and discussions on the current issues of magnetism, strongly correlated systems, spectroscopies, materials science, as well as progress in theory. The meeting should also provide ground for close interaction of students and other early-stage researchers with experienced specialists.

Regarding the venue for PCFES, the Faculty of Mathematics and Physics belongs to the youngest faculties of the Charles University, which was founded in 1348 by the Roman Emperor and King of Bohemia, Charles IV. The Faculty itself was founded in 1952, splitting from the Faculty of Science. The building Ke Karlovu 5, where the PCFES sessions will take place, is now over 100 years old. Careful reconstructions succeeded to provide high functionality while meticulously preserving or restoring most of the details, carrying the spirit of the founders in early 1900s as well as following generations of professors and students. Part of the laboratories of the Department of Condensed Matter Physics (technology, X-ray diffraction, high-pressure lab) is located on the ground floor of the building. Neighbour building in the Ke Karlovu street, number 3, is the official and administrative seat of the Faculty. It is followed by the Church of the Virgin Mary and St. Charlemagne, built in the 14<sup>th</sup> century and known for its unique vaulted central dome without any support. Unfortunately it is not open during weekdays. Those who stay till Sunday can attend the Holy Mass at 9 a.m. (in Czech) and at 17:00 (in Latin). The Church is open to visitors: Every Sunday from 2:00 p.m. to 4:30 p.m.

Down the street, the redbrick Maternity hospital and even farther the Psychiatric hospital (with the Antonin Dvorak museum opposite in a cute small baroque palace) complete the list of useful addresses.

*The 12<sup>th</sup> Prague Colloquium on  $f$ -Electron Systems takes place with the contribution of material and human potential of the Department of Condensed Matter Physics, Faculty of Mathematics and Physics, Charles University.*

## TOKIMEKI 2018

This year PCFES is organized together with “International Symposium: Correlated  $f$ -Electron Materials and Relation to Their Structures” (TOKIMEKI 2018), organized by Fuminori Honda (Ph.D.) from IMR, Tohoku University.

The aim of this symposium is to discuss and deepen our understanding of the rich physical phenomena in  $f$ -electron systems that arise from correlation effects and unique crystal structures. The anticipated focus of the symposium is on quantum critical phenomena, unconventional superconductivity, and novel magnetism in correlated  $f$ -electron systems. High quality single crystal growth techniques and recently obtained interesting experimental observations will be presented by the outstanding researchers.

*This symposium is supported by the Fund for the Promotion of Joint International Research (Fostering Joint International Research) from the Japan Society for the Promotion of Science (JSPS) KAKENHI with the grant no. JP15KK0149.*

Please feel comfortable in Prague, we wish you most enjoyable and productive days.

Silvie Mašková & Štěpán Sechovský  
On behalf of the PCFES Organizers

### **Poster session**

Besides the oral sessions, taking place in the lecture room F1, the discussions at posters will be possible on the 1<sup>st</sup> floor corridor. Presenters are requested to mount the posters as soon as possible and keep them for the whole duration of PCFES to allow informal discussions. One dedicated poster session will take place on Thursday evening, during which presenters are expected to be present at their posters.

### **Refreshment**

During PCFES, refreshment will be provided during coffee breaks and evenings. Lunches are not provided. You can find numerous small restaurants in the lively part of the town north of the Ke Karlovu street.

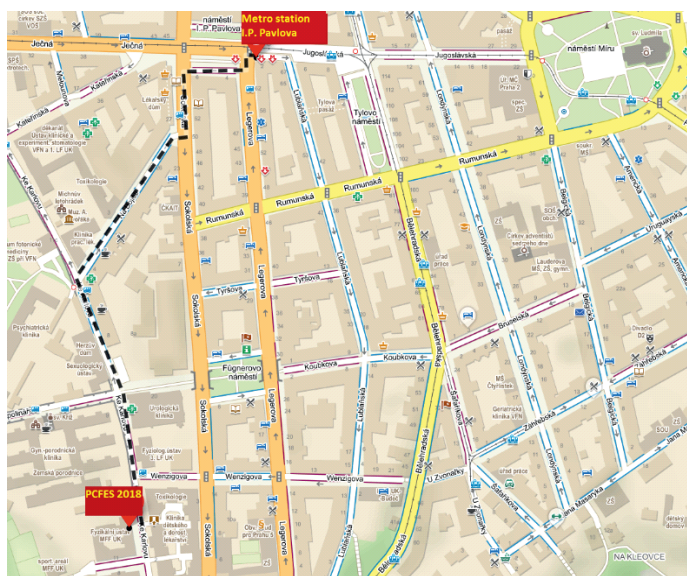
### **On-site connection to internet**

It is possible to connect using Wi-Fi via EDUROAM.

or

Special conference wifi access during the conference has been established.

Information update on: <http://kflk.cz/pcfes/>



## **Starting this year the PCFES is changing!!!**

Many of you probably noticed that Ladia Havela resigned from his post of main organizer of PCFES. We would like to express our immense gratitude for all the work he has done for the conference in the past.

This change is giving us opportunity to change also the tradition of PCFES.

After participation in an excellent colloquium CCFES held in Cracow in 2015 (<http://www.ccfes2015.up.krakow.pl>) the organizing committees of these two meetings have decided to merge the meetings.

The colloquium will be held regularly every 2 years but its location will be changing between Prague (Czech Republic) and Cracow (Poland).

**The future name of our colloquium is P/C-CFES.**

**The new website of the colloquium: : <http://www.kflk.cz/pc-cfes/>**



## PROGRAM

Wednesday July 4				
TOKIMEKI 2018				
Joint workshop	Chairperson	Fuminori Honda	IMR, Tohoku University, JP	
08:55-09:00	<i>Opening Tokimeki 2018</i>	<i>Fuminori Honda</i>	IMR, Tohoku University, JP	
09:00-09:30	Fermi surface instabilities and superconductivity in uranium compounds	Dai Aoki	IMR, Tohoku University, JP	<b>T1</b>
09:30-10:00	Tuning the uranium ferromagnetic superconductors with stress	Daniel Braithwaite	CEA Grenoble, FR	<b>T2</b>
10:00-10:30	Squeezing out hidden-order in URu <sub>2</sub> Si <sub>2</sub> under combined pressure and magnetic field	William Knafo	LNCMI CNRS Toulouse, FR	<b>T3</b>
10:30-11:00	<i>Coffee break</i>			
11:00-11:30	Antiferromagnetism and phase transitions in non-centrosymmetric UIrSi <sub>3</sub>	Jaroslav Valenta	Charles University, CZ	<b>T4</b>
11:30-12:00	Single Crystal Growth and Physical Properties of UPd <sub>2</sub> Cd <sub>20</sub>	Yusuke Hirose	Niigata University, JP	<b>T5</b>
12:00-12:30	Correlated <i>s</i> -Electron Systems in Regular Nanospace of Zeolite Crystals	Takehito Nakano	Ibaraki University, JP	<b>T6</b>
12:30-14:00	<i>Lunch break</i>			
<b>Invited talk</b>				
14:00-15:00	<i>f</i> and <i>d</i> elements in the periodic table: a unified description of electronic and optical properties	Mikhail Brik	Jan Dlugosz University, PL	<b>01_01 invited</b>
15:00-15:30	<i>Coffee break</i>			
Session I. RE-compounds	Chairperson	Tomasz Klimczuk	TU Gdansk, PL	
15:30-16:00	The study of YbPd <sub>2</sub> In indide and its physical properties at very low temperatures	Marian Reiffers	Presov University, SK	<b>01_02</b>
16:00-16:30	Magnetic, thermodynamic and transport properties of Gd <sub>3</sub> Ni <sub>2</sub> In <sub>4</sub>	Arun K	NIT Tiruchirappalli, IN	<b>01_03</b>
16:30-17:00	Structural and magnetic phase diagrams of RMn <sub>1-x</sub> Fe <sub>x</sub> O <sub>3</sub> system	Marian Mihalik	IEP SAS, SK	<b>01_04</b>
17:00-19:00	<i>Welcome Party</i>			

**Thursday July 5**

<b>Session II. Theory</b>	<b>Chairperson</b>	<b>Leonid Sandratskii</b>	<b>MPI Halle, DE</b>	
09:00-09:30	Electronic Structure of $U_3Ni_3Sn_4$ , $U_6Fe$ and $UNi_4B$	Hisatomo Harima	Kobe University, JP	<b>02_01</b>
09:30-10:00	Trivalent uranium states in $UPd_2Al_3$ , $UGa_2$ and $UGe_2$	Ryszard Radwanski	UP Cracow, PL	<b>02_02</b>
10:00-10:30	<i>Coffee break</i>			
10:30-11:00	Nozieres Exhaustion, Magnetic Ordering and Hidden Order in High Spin $SU(2)$ Kondo Lattices	Peter Riseborough	Temple University, USA	<b>02_03</b>
11:00-11:30	Superconducting order parameters in Heavy Fermion Systems: Power laws, symmetry, and topology	Gertrud Zwicknagl	TU Braunschweig, DE	<b>02_04</b>
11:30-12:00	Theory of resonant x-ray emission spectra at the L and M edges in compounds with localized $f$ electrons	Jindřich Kolorenč	IoP CAS, CZ	<b>02_05</b>
12:00-14:00	<i>Lunch break</i>			
<b>Session III. U-compounds</b>	<b>Chairperson</b>	<b>Jeroen Custers</b>	<b>Charles University, CZ</b>	
14:00-14:30	Extended stability range of the Non-Fermi liquid phase in $UCoAl$	Alexandre Kolomiets	Lviv Polytechnic Nat. U, UA	<b>03_01</b>
14:30-15:00	Physical properties of $UBeGe$	Andreas Leithe-Jasper	MPI-CPfS Dresden, DE	<b>03_02</b>
15:00-15:30	Chiral incommensurate magnet $UPtGe$ in strong magnetic field: experiment and theory	Leonid Sandratskii	MPI Halle, DE	<b>03_03</b>
15:30-16:00	<i>Coffee break</i>			
16:00-16:30	$U_4Ru_7Ge_6$ – electrical resistivity and magnetic studies	Petr Proschek	Charles University, CZ	<b>03_04</b>
16:30-17:00	Novel Heavy Fermion Compound	Eteri Svanidze	MPI-CPfS Dresden, DE	<b>03_05</b>
<b>17:00-19:00</b>	<b>Poster session</b>			

List of Posters			Code
Influence of Co-Fe substitution on the magnetism of DyFe <sub>5</sub> Al <sub>7</sub> : single-crystal study	Alexander Andreev	IoP CAS, CZ	P-01
Metamagnetism in ErCo <sub>4</sub> Al: single-crystal study	Alexander Andreev	IoP CAS, CZ	P-02
Samarium and neodymium easy -plane ferrobates. Magnetopiezoelectric effects	Tetiana Gaydamak	ILTPE NASU, UA	P-03
Superconductivity in the intermetallic Ce-based compound CeIr <sub>3</sub>	Karolina Górnicka	TU Gdansk, PL	P-04
Electronic structure and lattice dynamics of thorium from first-principles calculations	Lukáš Kývala	VŠB-TU of Ostrava, CZ	P-05
Upper critical and irreversibility fields in iron -based Ni- and Co- doped polycrystalline superconductors	Martin Nikolo	Saint Louis University, USA	P-06
Excess conductivity and pseudogap in Y <sub>1-x</sub> Pr <sub>x</sub> Ba <sub>2</sub> Cu <sub>3</sub> O <sub>7-?</sub> single crystals under pressure	Lyudmila Omelchenko	ILTPE NASU, UA	P-07
Structure and superconductivity properties in U <sub>1-x</sub> Ru <sub>x</sub> splat-cooled alloys ( $x = 0-18.5\%$ )	Sylwia Sowa	UP Cracow, PL	P-08
Onset of Magnetism in U <sub>2</sub> (Ni <sub>1-x</sub> Fe <sub>x</sub> ) <sub>2</sub> Sn	Zbigniew Tarnawski	AGH U. of Science and Technology, PL	P-09
Spin-polarized rhenium doped wurtzite ZnO: GGA+U study	Oksana Volnianska	IoP PAS, PL	P-10
Nuclear Forensics: Fission Track Analysis utilizing Light and Force Microscopy	Ariel Yosef	Clean Laboratory, Rotem Industries, IL	P-11
Advances in fission track detection and analysis or nuclear forensics and safeguards investigations	Itzhak Halevy	NRCN, IL	P-12

**Friday July 6**

<b>Session IV. Hydrides+Oxides</b>	<b>Chairperson</b>	<b>Kim Nhu-Tarnawska</b>	<b>UP Cracow, PL</b>	
09:00-09:30	Exotic magneto-elastic properties in uranium dioxide	Krzysztof Gofryk	Idaho National Laboratory, USA	<b>04_01</b> invited
09:30-10:00	High-temperature quaternary phases Dy <sub>2</sub> Ni <sub>2</sub> X <sub>0.2</sub> In <sub>0.8</sub> (X = Al, Ga) and their hydrides	Khrystyna Miliyanchuk	IFNU of Lviv, UA	<b>04_02</b>
10:00-10:30	<i>Coffee break</i>			
10:30-11:00	Structure, transport and magnetic properties of uranium-vanadium alloys and hydrides	Oleksandra Koloskova	Charles University, CZ	<b>04_03</b>
11:00-11:30	Structure and low temperature, physical properties of U-15at.% T alloys (T-selected 4d-5d metals)	Sylwia Sowa	UP Cracow, PL	<b>04_04</b>
11:30-12:00	Strong electron correlations in the UTi <sub>2</sub> stabilized by hydrogen	Volodymyr Buturlim	Charles University, CZ	<b>04_05</b>
12:00-14:00	<i>Lunch break</i>			
<b>Session V. Other materials</b>	<b>Chairperson</b>	<b>Ladislav Havela</b>	<b>Charles University, CZ</b>	
14:00-14:30	Nuclear forensics: New frontiers with TOF-SIMS techniques.	Itzhak Halevy	NRCN, IL	<b>05_01</b>
14:30-15:00	Orbital Selective Mott Physics in Iron-based Superconductor KFe <sub>2</sub> As <sub>2</sub>	Xianggang Qiu	IOP CAS, CN	<b>05_02</b>
15:00-15:30	Influence of Terbium nanoparticles addition on superconducting properties of BPSCCO	Amir Zelati	University of Birjand, IR	<b>05_03</b>
15:30-16:00	<i>Coffee break</i>			
16:00-16:30	Charge density waves and magnetism in RNiC <sub>2</sub> carbide family	Tomasz Klimczuk	TU Gdansk, PL	<b>05_04</b>
<b>19:00-22:00</b>	<i>Conference grill party</i>			



**Saturday July 7**

<b>Session VI. Ce-compounds</b>	<b>Chairperson</b>	<b>Krzysztof Gofryk</b>	<b>Idaho National Laboratory, USA</b>	
09:00-09:30	Non-Fermi Liquid Behavior at Antiferromagnetic Quantum Critical Point in Heavy Fermion System $Ce(Cu,Co)_2Ge_2$	Zakir Hossain	IIT Kanpur, IN	<b>06_01</b>
09:30-10:00	NQR/NMR study on Zn -doped $CeCoIn_5$	Hironori Sakai	JAEA, JP	<b>06_02</b>
10:00-10:30	<i>Coffee break</i>			
10:30-11:00	Magnetic study of substituted $Ce_{1-x}Gd_xNi_5$ system	Andrea Dzubinska	UPJS Kosice, SK	<b>06_03</b>
11:00-11:30	The nature of field-induced magnetic phases in $Ce_3Pd_{20}Si_6$	Dmytro Inosov	TU Dresden, DE	<b>06_04</b>
11:30-12:00	Ce- and Yb- based Kondo-lattice ferromagnets and their peculiar order along the magnetically hard axis	Daniel Hafner	MPI-CPfS Dresden, DE	<b>06_05</b>
12:00-12:15	<b>Conference summary</b>			

# Talks

# Posters

## List of participants

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Notes